

CLAIMS

 There are no amendments to the claims.

 X A complete listing of all claims ever present in this case in ascending order with status identifier is presented in a separate section.

COMPLETE LISTING OF CLAIMS

IN ASCENDING ORDER WITH STATUS INDICATOR

Claims 1-20 (Previously Canceled)

Claims 21-29 (Canceled)

30. (New) A method of forming a polarization hologram, comprising:

applying an organic polymer material to a surface of a transparent substrate;

drying said substrate and removing said organic polymer material from said substrate; and

heating and stretching said organic polymer material to form a birefringence layer, wherein said birefringence layer is provided on said substrate in a periodic grating pattern and wherein said birefringence layer has different refractive indexes for two orthogonal polarizing directions of a reflection beam, the polarization hologram diffracting the reflection beam in predetermined diffracting directions depending on the wavelength of an incident reflection beam.

31. (New) The method of claim 30, further comprising forming an isotropic overcoat layer therein to enclose said birefringence layer.

32. (New) The method of claim 30, wherein said organic polymer material is selected from among polycarbonate, polyvinylalcohol, polymethylmethacrylate, polystyrene, polysulfone, polyethylsulfone and polyimide.

33. (New) The method of claim 30, wherein the birefringence layer of the polarization hologram is configured with a heated and stretched polyimide film.

34. (New) The method of claim 33, wherein said polyimide film is prepared by applying a polyamide acid solution with a dimethylalcohol solvent to said substrate.

35. (New) The method of claim 30, wherein said heating is performed at a temperature of 350°C.

36. (New) The method of claim 30, wherein said stretching of said organic polymer material comprises stretching said organic polymer material in one direction.

37. (New) The method of claim 36, wherein a refractive index for said organic polymer material in said one direction of stretching is about 1.62.

38. (New) The method of claim 36, wherein the refractive index for said organic polymer material in a direction perpendicular to said one direction of stretching is about 1.49.

39. (New) The method of claim 38, wherein the difference between the refractive index for said organic polymer material stretched in said one direction and said direction perpendicular to said one direction is 0.13.

40. (New) The method of claim 30, wherein the polarization hologram is configured to substantially satisfy the following requirements

$$(n_p - n_l)h = m\lambda$$

$$(n_s - n_l)h = (m \pm \frac{1}{2})\lambda$$

where n_p is a refractive index of the birefringence layer for a p-polarized light of the reflection beam, n_s is a refractive index of the birefringence layer for an s-polarized light of the reflection beam, n_l is a refractive index of an isotropic overcoat layer, h is a depth of

the periodic grating pattern, L is a wavelength of the reflection beam, and m is an integer ($m=0, \pm 1, \pm 2, \dots$).

41. (New) The method of claim 30, wherein the polarization hologram is configured to substantially satisfy the following requirements

$$(n_p - n_l)h = (m \pm \frac{1}{2})L$$

$$(n_s - n_l)h = mL$$

where n_p is a refractive index of the birefringence layer for a p-polarized light of the reflection beam, n_s is a refractive index of the birefringence layer for an s-polarized light of the reflection beam, n_l is a refractive index of an isotropic overcoat layer, h is a depth of the periodic grating pattern, L is a wavelength of the reflection beam, and m is an integer ($m=0, \pm 1, \pm 2, \dots$).

42. (New) The method of claim 30, wherein said applying step includes spin coating.

43. (New) A polarization hologram comprising:

a transparent substrate;

a birefringence layer of a stretched organic polymer material provided on the transparent substrate in a periodic grating pattern, the birefringence layer having different refractive indexes for two orthogonal polarizing directions of a reflection beam.

44. (New) The polarization hologram of claim 43, further comprising an isotropic overcoat layer provided to enclose the birefringence layer therein, the polarization hologram diffracting the reflection beam in predetermined diffracting directions depending on the wavelength of an incident reflection beam.

45. (New) The polarization hologram of claim 43, wherein the birefringence layer has a thickness greater than a depth of the periodic grating pattern of the birefringence layer, and further comprises an isotropic overcoat layer, wherein said isotropic overcoat layer is not in contact with the transparent substrate.

46. (New) The polarization hologram of claim 45, wherein said polarization hologram comprises a second transparent substrate provided on the isotropic overcoat layer to cover the birefringence layer, and the isotropic overcoat layer being an isotropic resin adhesion layer, and the second transparent substrate being fixed to the birefringence layer by using the isotropic resin adhesion layer.

47. (New) The polarization hologram of claim 43, wherein the stretching of the organic polymer material creates a difference between the refractive indexes of the birefringence layer for two orthogonal polarizing directions of an incident reflection beam.